

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings of claims in the application:

Claims 1-32. (Canceled)

Claim 33 (Currently Amended): A method for forming a conic body, comprising:
performing high selectivity anisotropic etching of a substrate or predetermined layer
with a mixture gas by using as a micro mask an impurity precipitation defect caused by a first
impurity included in the substrate or predetermined layer; and
allowing a conic body to be exposed from a surface of the substrate or layer, the conic
body being formed with the impurity precipitation defect located at its top; and
adjusting the ratio of the mixture gas during the high selectivity anisotropic etching to
thereby adjust the aspect ratio of the conic body.

Claim 34 (Previously Presented): A method as defined in Claim 33, wherein
the substrate or the predetermined layer is a semiconductor material substrate or a
semiconductor material layer.

Claim 35 (Previously Presented): A method as defined in Claim 34, wherein
the impurity precipitation defect has an etching rate different from that of a main
component material of the semiconductor material substrate or layer; and
the impurity precipitation defect is a defect formed by precipitation of the first
impurity included in the semiconductor material substrate or layer into a crystal of the

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semiconductor material substrate or layer as a result of a thermal treatment performed during or after manufacturing of the semiconductor material substrate or layer.

Claim 36 (Previously Presented): A method as defined in Claim 34, wherein the semiconductor material substrate or layer comprises silicon; and the first impurity is oxygen.

Claim 37 (Currently Amended): A method for forming a conic body, comprising:
performing high selectivity anisotropic etching of a substrate or predetermined layer
by using as a micro mask an impurity precipitation defect caused by a first impurity included
in the substrate or predetermined layer; and
allowing a conic body to be exposed from a surface of the substrate or layer, the conic
body being formed with the impurity precipitation defect located at its top;
wherein the substrate or the predetermined layer is a semiconductor material substrate
or a semiconductor material layer; and
~~A method as defined in Claim 34,~~
wherein the semiconductor material substrate or layer further comprises a second impurity which more readily bonds to said first impurity than to a material of the semiconductor material substrate or layer.

Claim 38 (Previously Presented): A method as defined in Claim 37, wherein the semiconductor material substrate or layer comprises silicon; the first impurity is oxygen; and the second impurity is boron.

Claim 39 (Previously Presented): A method as defined in Claim 34, wherein the conic body is formed in an etching exposure surface of the semiconductor material substrate or layer so as to have a height in accordance with a distance from a location of the impurity precipitation defect to the etching exposure surface.

Claim 40 (Previously Presented): A method as defined in Claim 34, wherein when a plurality of impurity precipitation defects are present, the high selectivity anisotropic etching is performed to form, in an etching exposure surface of the semiconductor material substrate or layer, the conic bodies having substantially similar shapes each having the impurity precipitation defect located at its top and having a height in accordance with a distance from a location of the impurity precipitation defect to the etching exposure surface.

Claim 41 (Previously Presented): A method as defined in Claim 40, wherein the conic body formed in the etching exposure surface has a top end size in accordance with a size of the impurity precipitation defect, and an aspect ratio of about 10 or more.

Claim 42 (Previously Presented): A method for forming a truncated conic body, comprising:

performing high selectivity anisotropic etching of a substrate or predetermined layer by using as a micro mask an impurity precipitation defect caused by a first impurity included in the substrate or predetermined layer; and

allowing a truncated conic body to be exposed from a surface of the substrate or layer, the truncated conic body being formed with the impurity precipitation defect located at its top.

Claim 43 (Previously Presented): A method as defined in Claim 42, wherein the substrate or the predetermined layer is a semiconductor material substrate or a semiconductor material layer.

Claim 44 (Previously Presented): A method as defined in Claim 43, wherein the impurity precipitation defect has an etching rate different from that of a main component material of the semiconductor material substrate or layer; and the impurity precipitation defect is a defect formed by precipitation of the fast impurity included in the semiconductor material substrate or layer into a crystal of the semiconductor material substrate or layer as a result of a thermal treatment performed during or after manufacturing of the semiconductor material substrate or layer.

Claim 45 (Previously Presented): A method as defined in Claim 43, wherein the semiconductor material substrate or layer comprises silicon; and the first impurity is oxygen.

Claim 46 (Previously Presented): A method as defined in Claim 43, wherein the semiconductor material substrate or layer further comprises a second impurity which more readily bonds to said first impurity than to a material of the semiconductor material substrate or layer.

Claim 47 (Previously Presented): A method as defined in Claim 46, wherein the semiconductor material substrate or layer comprises silicon; the first impurity is oxygen; and

the second impurity is boron.

Claim 48 (Previously Presented): A method as defined in Claim 43, wherein the truncated conic body is formed in an etching exposure surface of the semiconductor material substrate or layer so as to have a height in accordance with a distance from a location of the impurity precipitation defect to the etching exposure surface.

Claim 49 (Previously Presented): A method as defined in Claim 43, wherein when a plurality of impurity precipitation defects are present, the high selectivity anisotropic etching is performed to form, in an etching exposure surface of the semiconductor material substrate or layer, the truncated conic bodies having substantially similar shapes each having the impurity precipitation defect located at its top and having a height in accordance with a distance from a location of the impurity precipitation defect to the etching exposure surface.

Claim 50 (Previously Presented): A method as defined in Claim 43, wherein after forming the truncated conic body in the substrate or predetermined layer by using as a micro mask the impurity precipitation defect, the high selectivity anisotropic etching is continued to remove the impurity precipitation defect and to etch a top end of the truncated conic body in a shape of a mortar from the top toward the bottom of the truncated conic body, thereby forming an annular shape at the top end.

Claim 51 (Previously Presented): A method as defined in Claim 50, wherein

the truncated conic body formed in the etching exposure surface has a top end diameter in accordance with a size of the impurity precipitation defect, and an aspect ratio of about 10 or more; and

the top annular portion has a thickness of 1nm to 2nm.

Claim 52 (Previously Presented): A method as defined in Claim 50, wherein the mortar shape formed at the top end of the truncated conic body is substantially similar to the shape of the truncated conic body.

Claim 53 (New): A method as defined in Claim 33, wherein a diameter of the conic body near its top end is 10 nm to 30 nm.

BASIS FOR THE AMENDMENT

Claim 33 has been amended as supported at page 5, lines 14-18 and at page 31, line 16 to page 32, line 3.

Claim 37 has been rewritten in independent form to include the limitations of original Claim 33 and Claim 34.

New Claim 53 has been added as supported at page 26, lines 14-20 of the specification.

No new matter is believed to have been added by entry of this amendment. Entry and favorable reconsideration are respectfully requested.

Upon entry of this amendment Claims 33-53 will now be active in this application.